ATN ThOR Series

operator's manual

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THOR SERIES OPERATOR'S MANUAL (REV. 4, MARCH 2012)

THERMAL DIGITAL RIFLESCOPES
Register your product warranty online at www.atncorp.com/warranty
The information in this manual furnished for information use only, is subject to change without notice, is not to be construed as a commitment by ATN Corp.
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SAFETY SUMMARY

STUDY CAREFULLY THIS MANUAL BEFORE TURNING ON AND OPERATING THIS PRODUCT.

CAUTION
The ATN ThOR Series Thermal Digital Riflescopes are precision electro-optical instruments and requires careful handling.

To provide safe use of the systems the following instructions should be observed:

- Do not dismantle the device.
- Keep the device clean; protect it from moisture, sharp temperature drops and shocks.
- Be careful not to touch the glass surfaces. If you put finger-prints on, or contaminate the glass surfaces, use only clean and soft materials to clean it.
- Do not leave the device in on position during stops in operation.
- Remove the batteries from the device for the period of storage.

This product contains natural rubber latex which may cause allergic reactions.

WARNING
Do not permanently attach the scope to dynamic-mount applications that continuously transmit vibration (such as on vehicles or heavy machinery).

WARNING
Do not point the scope directly at any high-intensity objects that you must not view with your eyes (such as the sun or a welding arc). If you do, you will damage the scope.

WARNING
Operating ThOR Series outside of its specified operating temperature range or voltage range can cause permanent damage and will void the warranty.

WARNING
Use the power button to turn the scope off before you remove power (remove batteries or disconnect external power supply).

4.3.2. CLEANING PROCEDURES

A. Cleaning the scope

1. Gently brush off any dirt from the sight body using only a clean soft cloth.
2. Moisten the cloth with fresh water and gently wipe the external surfaces (except lenses).
3. Dry any wet surfaces (except lenses) with another dry and clean soft cloth.
4. Using lens brush, carefully remove all loose dirt from the lenses.
5. Slightly dampen a cotton swab with ethanol and lightly and slowly wipe the lenses. Clean the glass surfaces by circular movements from the centre to the edge, not touching the lens holder and changing cotton swab after each circular stroke. Repeat this step until the glass surfaces are clean.

B. Cleaning of accessories
Clean accessories with a soft brush (cloth) and soap and water as required.

CAUTION
Dry thoroughly each item before replacing into the storage case.

4.3.3. PREPARING FOR EXTENDED STORAGE

To prepare the ThOR for extended storage, perform the following:

1. Check the scope for serviceability as outlined in item 4.1 of this manual.
2. Remove the batteries.
3. Clean the scope and accessories.
4. Replace all items in the case.

For customer service and technical support, please contact
American Technologies Network Corp.
1341 San Mateo Avenue, South San Francisco, CA 94080
phone: 800-910-2862, 650-989-5100; fax: 650-875-0129

www.atncorp.com

4.2.2. TROUBLESHOOTING PROCEDURES

Table 4-2. Troubleshooting Procedures

PROBLEM	PROBABLE CAUSE	CORRECTIVE ACTION
Image is absent	• Batteries are missing or improperly installed. • Batteries are dead. • Batteries contact surfaces or contact springs dirty or corroded.	• Insert batteries or install correctly. • Replace batteries. • Clean the contact surfaces with a pencil eraser and/or alcohol and cotton swabs.
Cannot achieve the sharp image of the object.	• Objective and output lenses dirty. • Damaged optical components.	• Clean thoroughly the lenses surfaces. • Send the sight to the service center.
The brightness of the image on the screen is low.	• The batteries have a low voltage. • Factory alignment broken.	• Replace the batteries. • Send the scope to the service center.

4.3. MAINTENANCE PROCEDURES

4.3.1. SCOPE MAINTENANCE

The ThOR maintenance consists of external inspection of its components for serviceability, cleaning and installation of the standard and optional accessories. Maintenance instructions covered elsewhere in this manual (PMCS, troubleshooting, etc.) are not repeated in this section.

CAUTION

The ThOR is a precision electron-optical instrument and must be handled carefully at all times to prevent damage.

WARNING

ThOR Series operates over a wide operating temperature range (-20°C to +60°C). Not all lithium batteries are specified over this same temperature span. Check the manufacturer's specifications of your selected battery to verify the valid temperature range.

WARNING

Do not use any battery other than a CR-123A lithium battery. DO NOT use any battery(ies) providing a (combined) voltage greater than 12.0 volts.

WARNING

Do not install batteries of different types (lithium with lithium-ion rechargeable). All batteries must be of the same type.

WARNING

Do not replace batteries in a possibly explosive environment, such as a gas station (or any place where you must turn off your vehicle engine). If you do, sparks can cause an explosion.

WARNING

Remove the batteries before you store the riflescopes for extended periods (2 weeks or more).

WARNING

Do not carry batteries in pockets containing metal objects such as coins, keys, etc. Metal objects can cause the batteries to short circuit and become very hot. In the case of lithium batteries, a short circuit could cause them to explode.

WARNING

Observe battery manufacturer's guidelines for safe handling and proper disposal of batteries.

EQUIPMENT LIMITATIONS

• The ThOR Series detector spectral band (7 to 14 mkm) provides a better penetration through smoke, smog, dust, water vapor etc.
• Infrared radiation does not travel through glass and therefore the scope does not sense objects if they are behind a glass window.

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7	Focus Ring	Check to ensure: • the focus ring cannot be moved along the sight body; • there is free rotation of the focus ring (more than 3/4 turn).	 • Focus ring able to move along sight body. • Focus ring cannot be rotated.
8	Rubber Eye-cup	Inspect for cuts or tears.	Rubber Eye-cup torn or cut.

AFTER CHECKING PROCEDURES:
Replace protective covers on the lenses. Remove the batteries. Return the scope and all accessories to the storage case.

4.2. TROUBLESHOOTING

4.2.1. GENERAL

This section contains information for locating and removal most of the ThOR operating troubles which may occur. Each malfunction for an individual component or assembly is followed by a list of tests or inspections that will help determine probable causes and corrective action to take. Perform the tests/ inspections and corrective actions in the order listed.
This manual cannot list all possible malfunctions that may occur, or all tests or inspections and corrective actions. If a malfunction is not listed (except when malfunction and cause are obvious), or is not corrected by listed corrective actions, contact to the service center.

SECTION IV
MAINTENANCE INSTRUCTIONS

4.1. PREVENTIVE MAINTENANCE CHECKS AND SERVICES (PMCS)

4.1.1. PURPOSE OF PMCS

PMCS is performed daily when in use to be sure that the sight is ready at all times. Procedures listed in Table 4-1 are a systematic inspection of ThOR that will enable you to discover defects that might cause the sight to fail on a mission.

4.1.2. FREQUENCY OF PERFORMING PMCS

The frequency of performing PMCS is as follows:
A. Daily when the sight is in use.
B. When it is removed from the case for any reason.

Table 4-1. Preventive Maintenance Checks and Services

SEQ. NO.	ITEM TO CHECK	CHECKING PROCEDURE	NOT FULLY MISSION CAPABLE IF:
1	Completeness	Inventory items by means of comparing with the data specified in this manual.	Items missing.
2	Sight Body	Inspect for missing screws or connector cap.	Screws or connector cap missing.
3	Front Lens Cap	Front Lens Cap Inspect for cuts, tears and dirt. Clean as required. Cap torn or cut.	Cap torn or cut.
4	Battery Compartment	Check for corrosion, springs tension. Springs corroded or damaged.	Springs corroded or damaged.
5	Lenses	Lenses Inspect for cleanliness, scratches, chips or cracks. Clean as required.	Chipped, cracked or if scratches hinder vision through the sight.
6	Objective Lens	Check to ensure the objective lens is not loose.	Objective lens loose.

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SECTION I
INTRODUCTION

1.1 GENERAL INFORMATION

1.1.1. SCOPE

This manual contains instructions for use in operating and maintaining the ATN ThOR Series Thermal Digital Riflescopes. Throughout this manual, the ATN ThOR Series will be referred to as the scope or ThOR.

1.1.2. REPORTS

Reports from the user on recommendations for improvements are encouraged. Send reports to the address below.

American Technologies Network Corp.
1341 San Mateo Avenue,South San Francisco, CA 94080
(800) 910-2862 , (650) 989-5100, (650) 875-0129 fax
info@atncorp.com • www.atncorp.com

1.1.3. STORAGE

Storage of ThOR should be done in the factory packing and after a thorough PMCS as outlined in Section 4.1 of this manual. This will ensure the scope remains in mission ready condition during storage. Batteries should be stored separately from the scope.

The scope should not be placed on the floor, in any area exposed to high temperatures or direct sunlight. Presence of acid and alkaline vapor, as well as of other aggressive admixtures in the air is unacceptable.

1.1.4. WARRANTY INFORMATION

One Year Product Warranty

This product is guaranteed to be free from manufacturing defects in material and workmanship under normal use for a period of 1 (one) year from the date of purchase. In the event a defect that is covered by the foregoing warranty occurs during the applicable period stated above, ATN, at its option, will either repair or replace the product, and such action on the part of ATN shall be the full extent of ATN's liability, and the Customer's sole and exclusive remedy. This warranty does not cover a product (a) used in other than its normal and customary manner; (b) subjected to misuse; (c) subjected to alterations, modifications or repairs by the Customer of by any party other than ATN without prior written consent of ATN; (d) special order or "close-out" merchandise or merchandise sold "as-is" by either ATN or the ATN dealer; or (e) merchandise that has been discontinued

To adjust vertical and horizontal adjustments for the scope go to menu 3 and use corresponding arrows:

- Up arrow for up adjustment
- Down arrow for down adjustment
- Left arrow for left adjustment
- Right arrow for right adjustment

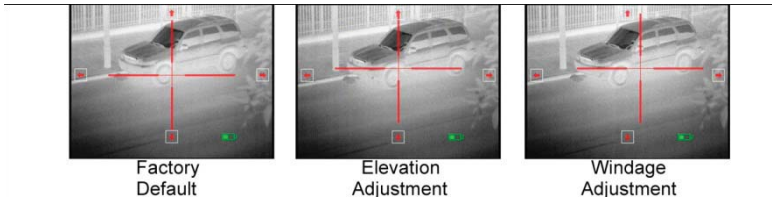


Figure 3-7. Windage and elevation Adjustments

3.2.9. SHUT DOWN OPERATIONS

To finish the work, perform the following:

1. Use the POWER button to turn the scope off.
2. Hold down the POWER button (3 seconds) until the ? icon goes away then release the POWER button. This is a safety so the system is not accidentally turned off.
3. Return the scope to the case.

Figure 3-4. Power Down

3.2.7. RETICLE COLOR

Your scope has Four reticle colors to choose from: red, green, white, black.

To select reticle color go to ISM Reticle menu and push Up arrow button to cycle through the reticle colors.

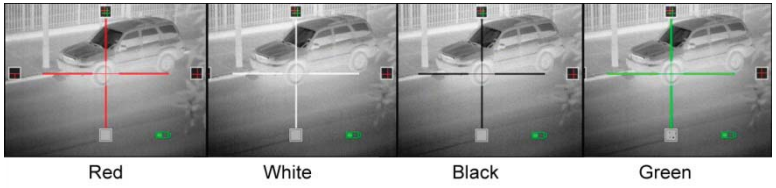


Figure 3-6. Reticle Adjustment

3.2.7. RETICLE PATTERN

Your scope has Five reticle types/patterns to choose from: duplex, post, post with dot, open cross hair, standard crosshair.

To select reticle type go to ISM Reticle menu and push Left arrow button to cycle through the reticle patterns.

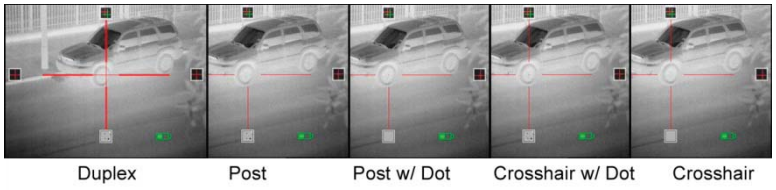


Figure 3-6. Reticle Patterns

3.2.8. RETICLE ADJUSTMENT/WINDAGE AND ELEVATION

To sight in/zero your scope go to ISM Reticle menu and push Right arrow button reticle adjustment.

This will bring you to ISM Reticle Adjustment menu which will allow you to do your vertical and horizontal adjustments.

by the manufacturer and either parts or replacement units are not available due to reasons beyond the control of ATN. ATN shall not be responsible for any defects or damage that in ATN's opinion is a result from the mishandling, abuse, misuse, improper storage or improper operation, including use in conjunction with equipment which is electrically or mechanically incompatible with or of inferior quality to the product, as well as failure to maintain the environmental conditions specified by the manufacturer. This warranty is extended only to the original purchaser. Any breach of this warranty shall be waived unless the customer notifies ATN at the address noted below within the applicable warranty period.

The customer understands and agrees that except for the foregoing warranty, no other warranties written or oral, statutory, expressed or implied, including any implied warranty of merchantability or fitness for a particular purpose, shall apply to the product. All such implied warranties are hereby and expressly disclaimed.

Limitation of liability

ATN will not be liable for any claims, actions, suits, proceedings, costs, expenses, damages or liabilities arising out of the use of this product. Operation and use of the product are the sole responsibility of the Customer. ATN's sole undertaking is limited to providing the products and services outlined herein in accordance with the terms and conditions of this Agreement. The provision of products sold and services performed by ATN to the Customer shall not be interpreted, construed, or regarded, either expressly or implied, as being for the benefit of or creating any obligation toward any third party of legal entity outside ATN and the Customer; ATN's obligations under this Agreement extend solely to the Customer. ATN's liability hereunder for damages, regardless of the form or action, shall not exceed the fees or other charges paid to ATN by the customer or customer's dealer. ATN shall not, in any event, be liable for special, indirect, incidental, or consequential damages, including, but not limited to, lost income, lost revenue, or lost profit, whether such damages were foreseeable or not at the time of purchase, and whether or not such damages arise out of a breach of warranty, a breach of agreement, negligence, strict liability or any other theory of liability.

Product warranty registration

In order to validate the warranty on your product, ATN must receive a completed Product Warranty Registration Card for each unit or complete warranty registration on our website at www.atncorp.com. Please complete the included form and immediately mail it to our Service Center: ATN Corporation, 1341 San Mateo Avenue, South San Francisco, CA 94080.

Obtaining warranty service

To obtain warranty service on your unit, End-user must notify ATN service department by calling 800-910-2862 or 650-989-5100 or via e-mail service@atncorp.com to receive a Return Merchandise Authorization number (RMA). When returning please take or send the product, postage paid, with a copy of your sales receipt to our service center, ATN Corporation at the address noted above. All merchandise must be fully insured with the correct postage; ATN will not be responsible for improper postage or, missing or damaged merchandise during shipment. When sending product back, please clearly mark the RMA# on the outside of the shipping box. Please include a letter that indicates your RMA#, Name, Return Address, reason for service return, Contact information such as valid telephone numbers and/or e-mail address and proof of purchases that will help us to establish the valid start date of the warranty. Product merchandise returns that do not have an RMA listed may be refused or a significant delay in processing may occur. Estimated Warranty service time is 10-20 business days. End-user/customer is responsible for postage to ATN for warranty service. ATN will cover return postage/shipping after warranty repair to end-user/customer only if product is covered by aforementioned warranty. ATN will return product after warranty service by domestic UPS ground and/or domestic mail. Any other requested, required or international shipping method the postage/shipping fee will be the responsibility of the end-user/customer.

1.2. DESCRIPTION AND DATA

1.2.1. DESCRIPTION

A. Purpose.
The ThOR Series Thermal Digital Riflescopes combines the ergonomic features of a handheld and the convenience of weapon mounting. Based on the proven 320 x 240 or 640 x480 microbolometer core, the ThOR is an ideal product for force protection, border patrol officers, police SWAT and special operations forces providing them the tools they need to be successful in all field conditions both day and night. Uncooled thermal imaging cuts through dust, smoke, fog, haze, and other battlefield obscurants. Its use cannot be detected as it emits no visible light or RF energy and operates without the use of illuminators or IR lights.

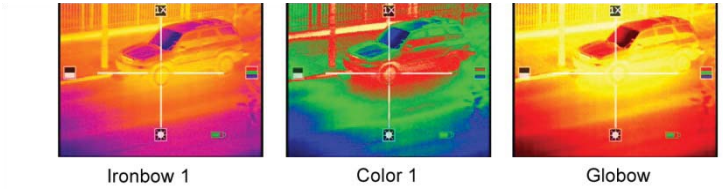


Figure 3-6. Color Modes

3.2.6. MANUAL IMAGE REFRESH / CALIBRATION

Degradation of the image (image blurring) is caused by charge accumulation on the detector array.

To use the calibration icon go to ISM Reticle menu and push down arrow button to maintain an optimum thermal image. During this refresh, the video will freeze for approximately 0.5 second.

IMPORTANT: To Perform calibration of unit. Cover front lens with cap or hand and push Calibration button to calibrate image. Failure to do this step may result in degradation of the image. Degradation may consist of unusual blurriness or ghost like spots in the image. During use if you see any degradation of image please recalibrate the scope.

Perform a calibration upon every substantial environmental temperature change.

NOTE
While performing very frequent Refreshes can provide the best possible image quality but also can substantially decrease the battery life.

Figure 3-5. Calibration (NUC)

The ThOR default optical magnification is depicted by the model number (for example THOR-1x is 1x, THOR-2x is 2x). When ZOOM button is pushed first time, the scope will digitally zoom a scene by 2 times the scopes optical magnification (i.e. THOR-1x becomes 2x, THOR-2x becomes 4x). When the zoom button is pushed the second time the scope will digitally zoom a scene by 4 times the scopes optical magnification (i.e. THOR-1x becomes 4x, THOR-2x becomes 8x). For THOR models with the 320x240 core.

To reset the magnification to the default optical magnification press ZOOM button third time. For THOR models with the 640x480 core when the zoom button is pushed the thrid time the scope will digitally zoom a scene by 8 times the scopes optical magnification (i.e. THOR-1.5x becomes 12x, THOR-2.5x becomes 20x). To reset the magnification to the default optical magnification press ZOOM button fourth time.

Note: Resolution decreases with each step of digital magnification.

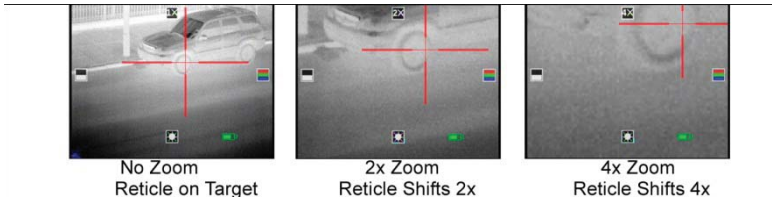


Figure 3-6. Zoom

3.2.3. COLOR MODES

The THOR has 10 additional color pallets to choose from in addition to the white hot and black hot polarity.

Fusion, Rainbow, Globow, Ironbow1, Ironbow2, Sepia, Color1, Color2, Ice Fire, Rain.

To select a different colors mode go to ISM Main menu and push Right arrow button to cycle through the 10 additional pallets. To go back to Black hot – white hot mode push left arrow button in ISM Main menu.

Figure 1-1. ATN ThOR-1 Thermal Digital Riflescope

Figure 1-2. ATN ThOR-2 Thermal Optical Riflescope

Figure 1-2. ATN ThOR-3 Thermal Optical Riflescope

B. Features.
ThOR has the following important features:

- High resolution digital thermal imaging
- Compact, lightweight and durable housing
- True magnification
- High end OLED display
- Four-colors reticle system
- Rapid start-up in 3 seconds

- Up to 8 hours operation with three lithium batteries
- One-Year Warranty
- Aircraft aluminum constructed body with class 3 hard anodized coating
- Digital Tactical Menu with quick view icons
- Memory Recall preserves operational settings
- Power-off safety feature prevents accidental shut down
- Recoil rated up to .308 caliber
- Polarity: white hot / black hot / color
- Thermal images viewable in up to 12-tone color pallet.
- Five reticle patterns: duplex, post, post with dot, open cross hair, standard crosshair
- Four reticle colors: red, green, white, black
- Ten-step brightness control
- Flexible battery cartridge can run on 1, 2, or 3 batteries.
- Batteries: (3) 3v lithium (CR123A) - AA optional (qty 4)
- Battery life: 8 hours (3V)

1.2.2. THOR STANDARD COMPONENTS

The ThOR standard components are shown in Figure 1-3 and presented in Table 1-1.

Figure 1-3. Thor Standard Components

3.2.3. POLARITY

The function of polarity switching is accessible only in Black and White models.

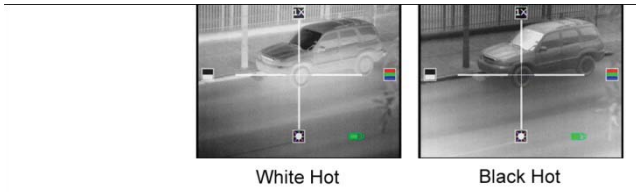


Figure 3-4. Display Polarity Modes

POLARITY button switches the direct display mode into the reverse one, i.e. from hot-white/cold-black into hot-black/cold-white mode. If the polarity is white-hot, the image will be with hotter objects displayed as white, and the rest of the image displayed as black, and vice versa: with hotter objects displayed as black, if the polarity is black-hot.

To select polarity go to ISM Main menu and push left arrow button to cycle between white hot and black hot polarities.

3.2.4. BRIGHTNESS

Brightness allows you to dim or increase the brightness of the display.
To cycle through the BRIGHTNESS steps go to ISM Main menu and push the down arrow button for brightness adjustment. Each short push of the buttons will cycle through the BRIGHTNESS modes, correspondingly, in stepwise way.

NOTE
Levels 1 to 10 range from full dim to full bright.

3.2.5. ZOOM

ZOOM button activates a digital zoom function.

320x240 models have 2 steps of digital zoom (factor of 2x and 4x)

640x480 models have 3 steps of digital zoom (factor of 2x, 4x and 8x)

To cycle through the digital zoom steps go to ISM Main menu and push Up arrow button.

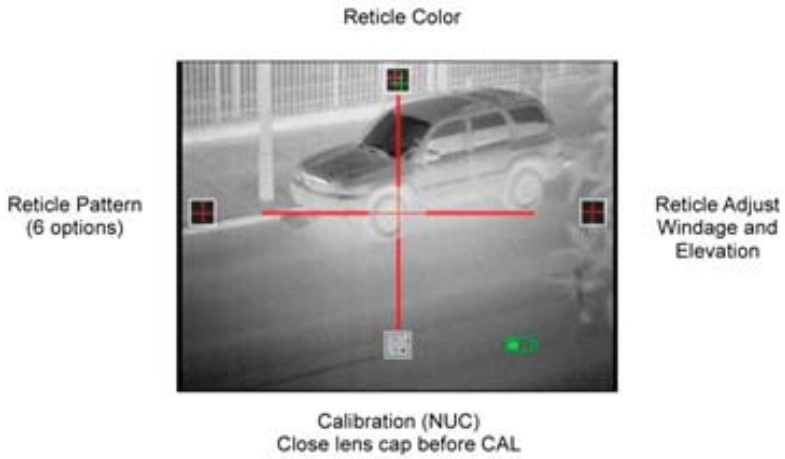


Figure 3-4. ISM Reticle Menu

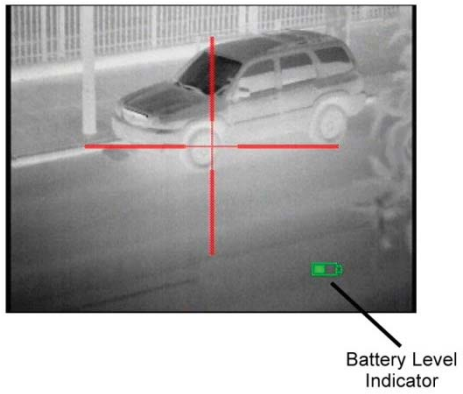


Figure 3-4. ISM No Menu

Table 1-1. ThOR Standard Components

ITEM	DESCRIPTION	QTY
1	Scope	1
2	Quick Release Mount	1
3	Hard Storage Case	1
4	Lens Tissue	1
5	Lithium Battery CR123A	3
6	Operator's Manual	1

1.2.3. SPECIFICATIONS

The following tables provide information pertaining to the operational, electrical, mechanical, optical and environmental characteristics for the sights.

Table 1-3. Specifications:

Sensor

Manufacturer	FLIR
Type	Uncooled Vox
Resolution	320x240 / 640x480
Frame Rate	60Hz / 30Hz
Thermal Sensitivity	<50mk
Spectral Response	7-14 um
Start Up	4 seconds

Sighting

Type	Digital Reticle
Adjustments	Windage and Elevation
Reticles	5 Patterns
Polarity	White, Black, Color
Colors	12 Pallets

Display

Type	OLED
Resolution	800 x 600
Menu	Digital Tactical Menu
Controls	Quickview Icons
Brightness	10 steps

Power

Battery type	(3) 3volt lithium CR123A
Run time	8 hours
Optional	(4) AA

Unit Specifications

ThOR-320-1X	**ThOR-320-2X**
Magnification 1X	Magnification 2X
Lens: 19mm GASIR f/1.2	Lens: 30mm Lens DLC Germanium f/1.2
E-Zoom: Yes	E-Zoom: Yes
Resolution: 320 x 240	Resolution: 320 x 240
FOV: 24°h x 18°v	FOV: 15°h x 11°v
Weight: 0.68 kg	Weight: 0.68 kg
Length: 165 mm	Length: 171 mm
Detection Range: 450 m	Detection Range: 700 m

ThOR-320-3X	**ThOR-320-4.5X**
Magnification 3X	Magnification 4.5X
Lens: 50mm Lens DLC Germanium f/1.2	Lens: 50mm Lens DLC Germanium f/1.2
E-Zoom: Yes	E-Zoom: Yes
Resolution: 320 x 240	Resolution: 320 x 240
FOV: 9°h x 7°v	FOV: 6°h x 4.7°v
Weight: 0.85 kg	Weight: 0.85 kg
Length: 203 mm	Length: 203 mm
Detection Range: 1100 m	Detection Range: 1300 m

The Thor 1x models (19mm lens) have a fixed front focus and are preset at 5m to infinity focus. Do not attempt to rotate front lens on the 1x models.

Figure 3-3. Focus Adjustment

NOTE
The front lens should be readjusted for viewing objects at different distances. Rotate the focusing ring clockwise for far focus, counterclockwise for near focus.

NOTE
Focus ring not available on THOR-1x model

3.2.3. ISM – Interactive Symbology Menu

The Thor features the all new ISM interactive symbology menu that enables you to easily navigate through the features and modes without having to go into a complex menu structure. Every mode and option can be found on one of the following ISM screens:

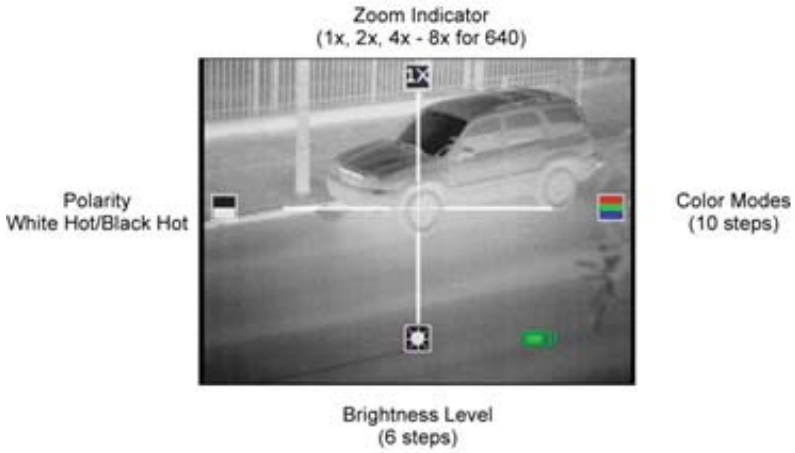


Figure 3-4. ISM Main Menu

3.2. OPERATING PROCEDURE

3.2.1. TURNING ON

Open the objective lens cover.

NOTE
The objective lens cover protects the scope from inadvertent exposure to extremely high levels of radiant flux. Never leave the scope with the objective lens cover off.

To turn the unit on press the button labeled POWER.

After a warm-up time of approximately 3 seconds, video of the thermal scene appears.

NOTE
During the warm-up time, a logo comes into view on the mono-cular display. Next the thermal image replaces the logo.

Figure 3-2. Switchboard of ATN ThOR

3.2.2. FOCUSING

To focus the scope you need to adjust the diopter first. The scope has an adjustable eyepiece with a range of +5 to -5 diopter. Simply turn the diopter clockwise until it stops. Then concentrate on any object and slowly turn the diopter back counter clockwise until the grain in the image is sharp. Then rotate the eyecup to accommodate use over the left or right eye.

The Thor 1.5x, 2x, 2.5x, 3x and 4.5x models have ability to focus either long range or short. Focus the front lens to rotate it until the image and the grain are both sharp.

ThOR-640-1.5X	ThOR-640-2.5X
Magnification 1.5X	Magnification 2.5X
Lens: 30mm Lens DLC Germanium f/1.2	Lens: 50mm Lens DLC Germanium f/1.2
E-Zoom: Yes	E-Zoom: Yes
Resolution: 640 x 480	Resolution: 640 x 480
FOV: 21°h x 16°v	FOV: 12.5°h x 9.7°v
Weight: 0.68 kg	Weight: 0.85 kg
Length: 171 mm	Length: 203 mm
Detection Range: 1050 m	Detection Range: 1500 m

1.2.5. MECHANICAL FUNCTION

The mechanical adjustments of the ThOR sights allow for physical differences between individual operators using the system. The scope functions include the Keypad, Output Connector, Eyepiece Diopter Adjustment Ring, Focusing Ring, Battery Module, Accessory Rail, and Weapon Mount. The controls are identified in Figure 1-5.

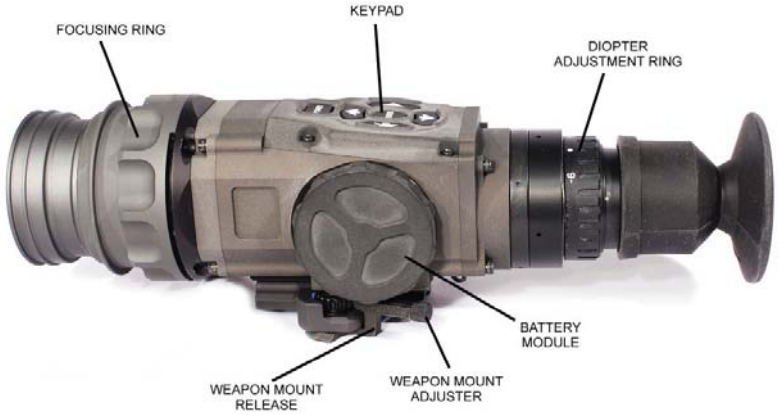
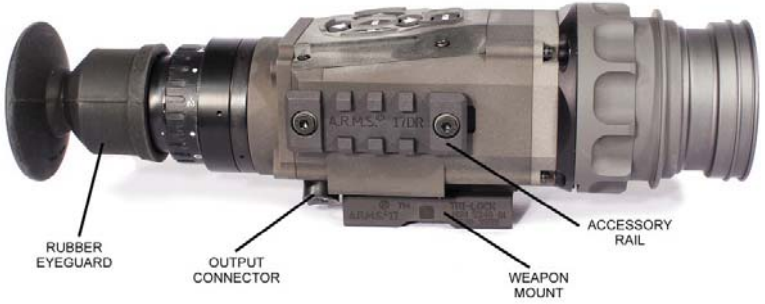


Figure 1-5. ThOR Mechanical Controls



NOTE
Focusing ring not available on THOR-1x model. The THOR-1x models (19mm lens) have a fixed front focus and are preset at 5m to infinity focus. Do not attempt to rotate front lens on the 1x models.

1.2.6. OPTICAL FUNCTION

The optical functions include an objective lens, thermal imaging detector, display and eyepiece. Infrared energy is emitted proportionally to the temperature of an object. The warmer the object, the more energy it emits. The infrared energy from the objects is focused by the optics, onto an infrared detector. The information from infrared detector is passed to electronics for image processing. The signal processing circuitry translates the infrared detector data into an image that can be viewed on the built-in OLED display. The image is observed through an eyepiece by operator.

1.2.7. ELECTRICAL FUNCTION

The electronic circuit is powered by replaceable four 3V lithium batteries (CR123A).

Power from the batteries is supplied to the components through the Power button.

SECTION II
ASSEMBLY AND PREPARATION

2.1. PREPARATION

2.1.1. PREPARATION FOR USE

This chapter contains the information necessary to prepare the scope for operation. This includes unpacking, examination for da-mage, and batteries installation.

A. Unpacking

The following steps must be accomplished prior to each mission where the sight is used.

1. Open carrying case, remove the scope and check contents for completeness.
2. Inspect the scope for obvious evidence of damage to optical surfaces, body, eyecups, operation buttons, etc. Ensure that all optical surfaces are clean and ready for use. Clean with lens tissue.

3.1.2. CONTROLS AND INDICATION

The ThOR scope is designed to adjust for different users and corrects for most differences. The controls for the scope are shown or described in Figure 3-1 and Tables 3-1.

Figure 3-1. Controls

Table 3-1. Controls and Indication

ITEMS	CONTROLS AND INDICATORS	FUNCTIONS
1	POWER Button	Controls scope power. To turn the unit on and off press the button
2	ENTER Button	Used to select or enter selection.
3	UP Arrow	Digital Zoom, Reticle Color, Elevation Up Adjustment
4	DOWN Arrow	Brightness, Calibration, Elevation Down Adjustment
5	LEFT Arrow	Polarity, Reticle Type, Windage Left Adjustment
6	RIGHT Arrow	Color Modes, Reticle Adjustment, Windage Right Adjsutment

Figure 2-4. ThOR with Video Cable

Connect the scope to an external video display/recorder as follows:

1. Video cable (Optional accessory).
2. Remove the protective cap from the connector socket.
3. Attach the video cable to the ThOR output connector socket.
4. Attach the RCA plug of the RCA video adapter to a compatible jack on an external video display/recorder, or extension cable.

SECTION III
OPERATION

3.1. GENERAL INFORMATION

3.1.1. GENERAL

This section contains instructions for operation of ThOR. The function of controls and indicators is explained.

CAUTION

The ThOR scope is a precision electron-optical instrument and must be handled carefully at all times.

B. Installation of Batteries.

WARNING

The lithium battery contains sulfur dioxide gas under pressure.

Do not heat, puncture, disassemble, short circuit, attempt to recharge or otherwise tamper with the batteries.

Turn off equipment if battery compartment becomes unduly hot. If possible, wait until the batteries have cooled before removing them.

If you inhale sulfur dioxide, seek medical attention.

The ThOR will operate with 1, 2 or 3 CR123A Lithium batteries type. For best battery performance use all 3 batteries.

Install CR123A Lithium batteries as follows.

1. Remove the battery module by unscrewing it counter clockwise.
2. Observe polarity, by placing the negative side of the battery against the spring, and insert the 3.0 Volt CR 123A Lithium batteries into the battery module.
3. Replace battery module into the housing. Screw clockwise until finger tight. Do not over tighten as it will be difficult to remove the next time you replace batteries.

Figure 2-1. Loading Battery Module

Figure 2-2. Install battery Module

2.1.2. EXAMINATION FOR OPERATION

Before getting started make sure to follow these steps:

1. Push Power button on the scope.
2. Make sure that the luminance in ocular is present.
3. Observe the scene, and adjust the diopter and/or lens for optimal image clarity.

2.2. ASSEMBLY

2.2.1. REMOVE/INSTALLATION OF QUICK RELEASE MOUNT (QRM)

ARMS #17 Lever Quick Release Mount (QRM) is used for fast installation/ removing the ThOR on MIL-STD-1913/Picatinny rail.

Figure 2-2. Lever Quick Release Mount

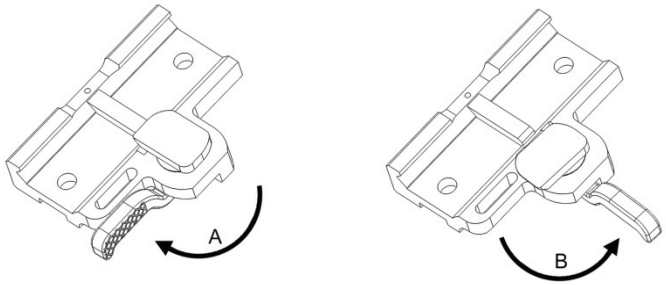


Figure 2-3. Quick Release Mount adjustment

1. To open the QRM, slide the cam latch forward (arrow A)
2. Place the scope onto rail. Be sure to engage the recoil lug into the groove on the top mounting surface of the rifle.
3. Turn the cam backwards pushing the latch to close the mount (arrow B).
4. The QRM may be adjusted to eliminate excessive play when mounted on the rail by using the adjustment knob on the lever to release the lever from the adjuster.

2.2.2. VIDEO OUTPUT

The ThOR incorporates a sealed connector used for video transmission. A RCA video/power adapter attaches the scope to the video facilities for video recording or video transmission to the external display.